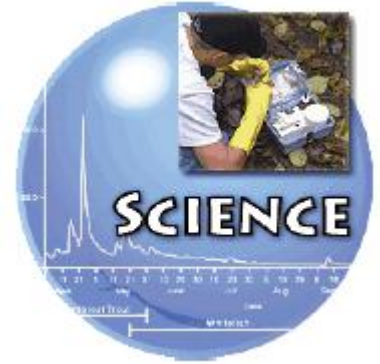


LESSON 15: EFFECTS OF THE ELWHA RIVER DAMS



ESSENTIAL QUESTION:

What combination of factors (both natural and man-made) is necessary for healthy river restoration and how does this enhance the sustainability of natural and human communities?

GUIDING QUESTION:

The building of the Elwha River Dams had a huge impact on the anadromous fish of the Elwha River, why were the dams built in the first place, how have they affected anadromous fish and the surrounding environment, and why are they coming down?

OVERVIEW:

This lesson focuses on the impacts that the building of the two dams on the Elwha River had on anadromous fish species, including the loss of 70 miles of river habitat for migrating fish, the effects of sediment loss on spawning grounds downstream, and general habitat degradation downstream. Learn about pre-dam conditions both in-river and in the surrounding terrestrial environment. Then hear the story of Thomas Aldwell, the entrepreneur who built the first dam and refused to accommodate fish. Finally, discuss the political and environmental conditions that led to the decision to remove the dams.

TIME:

Two class periods

MATERIALS:

- **Lesson 15- Effects of the Elwha River Dams.pptx**
- **Lesson 15a- Effects of the Elwha River Dams.pdf**
- Access to computers.
- Student page (printable handout – 2pages)
- Reflection Journal pages (printable handout)

PROCEDURE:

1. Review Essential Question; introduce Guiding Question.
2. Students should take a few minutes to respond to the first reflection prompts. Discuss their answers and any questions they've generated.
3. Present the PowerPoint Lesson
4. Refer to readings (web sites below) and the PowerPoint Lesson to have students prepare newspaper articles on the building of the dams, the effect on salmon and finally the removal of the dams:

<http://www.pbs.org/americanfieldguide/teachers/salmon/history.pdf>
http://www.historylink.org/index.cfm?DisplayPage=pf_output.cfm&file_id=7590

5. Have students use the following web site to build then publish their article(s)
http://interactives.mped.org/view_interactive.aspx?id=110&title=
6. Hand out the second Reflection Journal Page. Give students time for a final reflection the lesson.

ASSESSMENTS:

- Reflection journal (rubric attached)
- Newspaper article rubric (Attached)

WASHINGTON STATE STANDARDS:

SCIENCE

1. EALR 4:Life Science

- a. **LS2A** An ecosystem consists of all the populations living within a specific area and the nonliving factors they interact with. One geographical area may contain many ecosystems.
- b. **LS2D** Ecosystems are continuously changing. Causes of these changes include nonliving factors such as the amount of light, range of temperatures, and availability of water, as well as living factors such as the disappearance of different species through disease, predation, habitat destruction and overuse of resources or the introduction of new species.
 - i. Identify resource uses that reduce the capacity of ecosystems to support various populations (e.g., use of pesticides, construction).
- c. **LS3A** The scientific theory of evolution underlies the study of biology and explains both the diversity of life on Earth and similarities of all organisms at the chemical, cellular, and molecular level. Evolution is supported by multiple forms of scientific evidence.
 - i. Explain and provide evidence of how biological evolution accounts for the diversity of species on Earth today.
- d. **LS3E** Adaptations are physical or behavioral changes that are inherited and enhance the ability of an organism to survive and reproduce in a particular environment.
 - i. Give an example of a plant or animal adaptation that would confer a survival and reproductive advantage during a given environmental change.

WRITING

2. **EALR 1:** The student understands and uses a writing process.

3. **EALR 2:** The student writes in a variety of forms for different audiences and purposes.
4. **EALR 3:** The student writes clearly and effectively.

SOCIAL STUDIES

1. **EALR 5:** The student understands and applies reasoning skills to conduct research, deliberate, form, and evaluate positions through the processes of reading, writing, and communicating.
 - a. **Component 5.2:** Uses inquiry-based research.

VOCABULARY REVIEW:

- **Watershed:** The drainage basin where all precipitation (snow and rain) on the surface or below ground, drains into a single river or lake on the way to the ocean or to an endorheic basin.
- **Dam:** A barrier constructed across a waterway to control the flow or raise the level of water.
- **Reservoir:** A man-made water containment system often the result of lake filling behind a dam, but also can be water stored in large tanks or underground storage.
- **Anadromous-** (*uh-nad-ruh-muh s*) A fish that is born in freshwater, migrates to the ocean to spend its adult life, and returns to freshwater to spawn.



Elwha River Restoration
Effects of the Elwha River Dams
Reflection Journal 1

Besides salmon how do you think the Elwha River Dams have affected the Lower Elwha Klallam Tribe and the community of Port Angeles? Have dams affected people and salmon in other communities?

What questions or ideas do you have about the Elwha River Dams?



Elwha River Restoration

Effects of the Elwha River Dams

Student Page

YOUR TASK:

Read the Articles about the Elwha Dams at:

- <http://www.pbs.org/americanfieldguide/teachers/salmon/history.pdf>
- http://www.historylink.org/index.cfm?DisplayPage=pf_output.cfm&file_id=7590

Then, using the information you gathered watching the PowerPoint Lesson and reading the articles, write three newspaper stories on, first, the building of the dams, next, the effect of the dam on salmon migration, and finally, on the removal of the dams.

You can format and publish your stories at the following web site:

- http://interactives.mped.org/view_interactive.aspx?id=110&title

REMEMBER A GOOD NEWS STORY...

- Has a title or headline
- Starts with a summary lead.
- Answers these questions: who, what, when, where, why
- The most important information should appear at the beginning of your article, but remember to keep your lead brief and simple.
- The next paragraph should expand or develop some idea introduced in the lead.. Make sure you check your facts from the articles. Be objective. This is a news story, not an editorial. In other words, you don't get to have an opinion. Use direct quotations if possible. Remember that news stories are about people and need to be concise and interesting.

- The conclusion should tie up all the loose ends of the story and give it finality. The reader should be satisfied that he/she knows all he/she needs to know.
- Your articles should be about 200 words, which isn't a lot so be concise.
- Proofread, proofread, proofread then proofread again! Check for spelling, grammar and usage. Then have someone else proofread for you.
- All news stories have deadlines. Ask your teacher when your stories are due.
- Make your published articles more appealing by adding photographs. You can find great pictures of salmon and the Elwha River Dams at the NPS web site.
- Check the grading rubric to make sure you've written a fantastic article.

If you have a student news network you may want to report you stories to the whole school.



Elwha River Restoration
Effects of the Elwha River Dams
Reflection Journal 2

How will the removal of the Elwha River Dams benefit the river, marine and terrestrial ecosystems, and mostly how will it benefit salmon?

Do you have any more questions or comments (you are allowed to have an opinion this time) on the removal of the dams?

Elwha River Restoration
Effects of the Elwha River Dams
News Story Rubric

Outstanding response (4)

The article(s) establishes a clear purpose in the lead paragraph and demonstrate a clear understanding of the topic. The article(s) clearly answers the questions: who, what, when, where, and why. The article(s) is organized with a clear and interesting beginning that introduces the audience to the topic, provides supporting details in the middle and includes an ending that leaves the reader satisfied. The details in the articles are concise, effective, and vivid. The article(s) is about 200 words. The article(s) are exceptionally attractive in terms of design, layout, and neatness. There are no grammatical or spelling mistakes in the article(s)

Above-average response (3)

Most (80%) of the article(s) establishes a clear purpose in the lead paragraph and demonstrate a clear understanding of the topic. The article(s) adequately answer the questions who, what, when, where, and why. The article(s) is mostly organized with a clear beginning, provides supporting details in the middle and includes an ending. The details in the articles are concise and pertinent most of the time. The article(s) is about 200 words. The article(s) is attractive in terms of design, layout and neatness. There is one grammatical or spelling mistake.

Average response (2)

Some (70%) of the article (s) establishes a clear purpose in the lead paragraph and demonstrates a somewhat clear understanding of the topic. The article misses one of the five lead questions. The article is somewhat organized, but isn't as clear as it could be in its beginning, supporting details and ending. The details in the article are repetitive or disorganized and/or unclear. The article is less than 180 words, or more than 220. The article is somewhat attractive in terms of design, layout and neatness. There are two or more spelling and/or grammatical errors.

Below-average response (1)

Much of the article(s) lacks a clear purpose in the lead paragraph and demonstrates little clear understanding of the topic. The article misses more than one of the five lead questions. The article is disorganized without a clear beginning middle and end. The details are sparse and/or vague. The article is significantly less than 200 words or significantly more than 200 words. The article is thoughtless in terms of design, layout and neatness. There are many spelling or grammatical errors.

Failure to respond to the assignment (0)

No effort was made to identify relevant requirements. Presentation and research was either left unfinished or not attempted at all

Reflection Journal Rubric

Outstanding response (4)

An outstanding reflection journal response is an original, thought-provoking response to the questions raised in the prompt. It contains specific examples from both the student's experiences as well as the classroom material whenever possible. It asks original, provocative, relevant questions. It is also virtually free of grammatical errors.

Above-average response (3)

An above-average journal thoroughly addresses the questions raised in the prompt. It contains specific examples from both personal experiences as well as the classroom material whenever possible. It asks provocative, relevant questions. It may contain some minor grammatical errors.

Average response (2)

An average journal competently addresses the issue raised in the prompt. It contains some examples from both personal experiences as well as the classroom material whenever possible. It asks relevant questions. Grammatical errors may be present, but they will not impede the reader from understanding the context of the sentences.

Below-average response (1)

A below-average journal does not competently address the issue raised in the prompt. It contains few examples from personal experiences or the classroom material. It asks easy questions. Grammatical errors are so rampant that they impede the reader from understanding the context of the sentences.

Failure to respond to the assigned prompt (0)

A failing journal does not address the issue raised in the prompt at a middle school level. It contains very few examples of personal experiences as well as classroom material, or the student fails to respond at all. Grammatical errors are so rampant that they impede the reader from understanding the context of the sentences.